Executive Office of Environmental Affairs

ANNUAL REPORT

Massachusetts Department of Natural Resources

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To meet the growing complexity of demands on our environment the Department of Natural Resources has, over the years, evolved from an old-time conservation agency into a modern multidivisional environmental organization. This 1970 Annual Report is our first attempt to provide a total overview of the responsibilities and accomplishments of the Department's various divisions. We feel it is important to those who will read our Annual Report to know the relationship of our Department's agencies to the massive job of protecting and managing the valuable natural resources of the Commonwealth.

No one segment of the Department stands alone. All divisions interrelate with each other as well as with many public and private agencies and groups. Together we are working toward the common goal of a quality environment. Through its dedicated personnel and varied programs the Department of Natural Resources is making what we believe is a substantial contribution to a better life for Massachusetts citizens.

Cordially,

Arthur W. Brownell

Commissioner

CONTENTS

Conservation Services 2
Forests and Parks 8
Law Enforcement 14
Marine Fisheries 16
Mineral Resources 20
Water Pollution Control 22
Water Resources 28
Public Access Board 30

CONSERVATION SERVICES

The Division of Conservation Services interlocks with every area of DNR. Established as a liaison between state and local conservation programs, Conservation Services carries out the following functions: it supervises the 15 regional conservation districts; assists municipal conservation commissions in their efforts to preserve and acquire open space; administers coastal and inland wetlands legislation; and reviews applications to the U. S. Bureau of Outdoor Recreation for financial assistance under the Land and Water Conservation Fund Act of 1965.

Conservation Districts and Commissions

Composed of five members elected in each region, a conservation district provides land-use information and assistance to conservation commissions, town planning boards, municipal and county agencies and individual landowners. In conjunction with the U. S. Soil Conservation Service the districts prepare soil analyses and water impoundment studies. Under Massachusetts law districts have a wide range of powers: they conduct surveys, supply limited financial aid, and act to improve land by putting private and public land owners in touch with the technical teams of Forests and Parks, Fisheries and Game, and the Soil Conservation Service.

A conservation commission, composed of from three to seven members appointed by selectmen or mayors, is the local grassroots organization entrusted to preserve a town's meadows, forests, marshes, fields--any open space in which one can breathe, walk, play or just experience relief from the oppressiveness of urban development.

A commission's major responsibility is planning. Included in its planning power is the right to build roads, construct trail systems and boat-launching sites, develop bathing beaches and picnic areas and acquire any land vital to improving the town's environment. Many acquisitions not only furnish a variety of recreational facilities but also protect watershed areas from pollution and housing construction encroachment.

After a town or city has established a conservation commission it is eligible to receive financial assistance under the Massachusetts Self-Help Act (General Laws Chapter 132A, Section 11). Administered by the Division of Conservation Services, the self-help program offers to towns and cities up to 50 percent reimbursement for the cost of land purchased or developed for conservation and outdoor recreation purposes.

Since the inception of the self-help program in 1961 the state has reimbursed municipalities more than $2.6 million for 269 projects involving the acquisition of 8650 acres. In 1970 Conservation Services reimbursed $606,654 for 46 projects involving 1980 acres. The success of conservation commissions is further supported by the fact that 287 towns in Massachusetts have conservation commissions. Last year six additional commissions were formed in the towns of Southbridge, Orange, Douglas, Pelham, Adams and Brimfield. Other New England states have been so impressed with the success of Massachusetts commissions that they have begun to initiate similar conservation commission programs.

Coastal Wetlands: The Jones Act and Coastal Wetlands Act

Over the years Massachusetts has lost thousands of acres of coastal wetlands through land development. In a ten-year period alone, from 1954-64, more than 1000 acres of the state's coastal wetlands disappeared. This destruction has been considerably slowed in recent years because of the rise of local conservation commissions, the establishment of the Cape Cod National Seashore and the passage of the Jones and Coastal Wetlands acts.

The Jones Act (G.L. Ch. 139, Sec. 27A) was adopted in 1963 to safeguard shellfish and marine fisheries against the cumulative deterioration of estuaries and coastal wetlands. It is an emergency law designed to restrict dredge and fill operations. The law empowers the Department of Public Works and the DNR to put an immediate temporary hold on proposed dredge and fill activities. But its authority is limited in that it does not allow the state to take any action until development plans on a wetland already exist. Nevertheless, in 1970, Conservation Services processed 121 Jones Act applications ranging from small dredge and fill operations for homes to large-scale salt marsh alterations for marinas and industrial complexes.

While the Jones Act is essentially stopgap legislation, the Coastal Wetlands Act is designed to guarantee permanent protection to salt marshes found by DNR

to have high natural resource potentials. Under the Coastal Wetlands Act DNR can move to preserve a salt marsh before development pressures become too great. For the most part the Department's restrictions on uses of coastal wetlands have been favorably received. In the first major application of the Act 3500 acres of the Ipswich salt marshes were restricted and there were no appeals from the more than 200 landowners.

To date 11,250 acres of salt marsh have been restricted in Pembroke, Quincy, Ipswich, Wareham, Marshfield, Norwell, Hanover, Rowley, Essex, Newburyport and Westport. Public hearings have been held and restrictive orders are pending on an additional 9524 acres in Salisbury, Scituate, Newbury, Gloucester, Wareham and Marion. Surveying and evaluation of other coastal regions is in progress and public hearings in these areas will be scheduled in the near future.

Inland Wetlands: Hatch Act and Inland Wetlands Act

Of the state's 300,000 inland wetland acres (6 percent of the Commonwealth's area), some 82,000 acres, according to one recent study, are imperiled by land development. Such a loss would be equivalent to the destruction of an area the size of Greater Metropolitan Boston. To stem this tide of wetland mortality obliteration of bogs, marshes, swamps bordering on inland waters or subject to freshwater flooding -- the Massachusetts General Court passed the Hatch Act in 1965 (G.L. Ch. 131, Sec. 40) and the Inland Wetlands Act in 1968 (G.L. Ch. 131, Sec. 40A).

Like the Jones Act the Hatch Act is an emergency dredge and fill law dealing with isolated parcels of wetland. The law cannot restrict wetland use until development is imminent. During the past year Conservation Services devoted a substantial amount of time considering Hatch Act applications. Of these applications filed, 266 were submitted by individuals or private developers, 43 by municipalities (most frequently involved were dump sites in wetland areas and 13 by public utility companies.

The Inland Wetlands Act attempts to provide permanent protection to large critical wetland areas such as entire river valleys. Under this law, in order to preserve inland wetlands, DNR must identify wetlands of crucial importance, develop land-use plans that recommend methods of control and preservation, and present the proposals at public hearings in the towns or regions in which the wetlands lie.

Since the Act's passage in 1968 considerable study has been necessary to determine priority areas to be protected and to establish an effective procedure for solving technical problems. For this project Conservation Services, after reviewing seven major watersheds in eastern Massachusetts, selected as the pilot area the Charles River watershed which encompasses 300 square miles and 35 municipalities.

The Land and Water Conservation Fund

In January 1965 the Land and Water Conservation Fund Act, administered by the Department of Interior's Bureau of Outdoor Recreation, became effective, authorizing federal funds to states in the planning, acquisition, and development of important public outdoor recreation areas. To be eligible for the 50 percent reimbursement possible under this Act, local and state agencies must submit projects which are in accord with the aims of a state's comprehensive outdoor recreation plan.

Conservation Services reviews and coordinates all BOR applications in Massachusetts. Since the inception of the Land and Water Conservation Fund program, 53 projects have been approved for funding by BOR. Of the applications approved, 23 were filed by cities and towns, 15 by DNR, 7 by the Department of Public Works, 5 by the Metropolitan District Commission, and 3 by the Division of Fisheries and Game. A recent schedule of BOR apportionments indicates that about $6,615,000 may be available to Massachusetts in fiscal 1971.

FORESTS AND PARKS

Forests and Parks is the largest and most diversified division in DNR. Under its supervision are approximately 280,000 acres of land and water, including all state forests, parks, and reservations and all state operated ocean beaches, swimming pools, and skating rinks outside the Metropolitan District Commission area. Although the primary concern of the Division is to provide recreational opportunities for Massachusetts residents and visitors, it is also actively involved with promotion of sound forestry practices, prevention and control of forest fires, regulation of insect pests, and the safe storage of dangerous pesticides. In short, the Division's responsibility is to protect and help manage the 3.5 million acres of public and private forest lands in Massachusetts for the greatest benefit of the general public without causing environmental deterioration.

Recreation

Anyone who swims at Horseneck Beach, camps at Nickerson State Park, skis at Wachusett Mountain State Reservation, or skates at the Shine rink in Worcester is utilizing facilities provided, staffed, and maintained by Forests and Parks. Like other states, Massachusetts has become increasingly recreation minded since the end of World War II. In 1970 attendance at state operated recreation facilities reached an all-time high of 5,819,284 persons, a 23 percent increase over 1969.

This substantial rise in attendance reflects a greater use by the public of all recreation areas during all seasons of the year. It also indicates the popularity of skating rinks and swimming pools. Legislation passed in 1970 will provide funds to finance construction of pools and rinks in 15 communities to help meet this popular demand.

To accommodate the growing interest in winter recreation Forests and Parks for the first time permitted winter camping. This year the heaviest camping occurred during deer hunting season and at coastal sites where fishing is possible year round. The Division also managed parks for snowmobile use. Early snow in eastern Massachusetts, combined with the normally long snow season in western sections of the state, provided an excellent snowmobile season.

Because of the pressures to expand recreational facilities in Massachusetts, Forests and Parks, in 1970, inspected, master planned, and recommended for acquisition approximately 100 parcels of land, including the 425 - acre Fiske - Hall property in Framingham which has been acquired by the Department. The master plan, which formulates the most desirable recreational uses of the land and water resources in a particular area, has become the basis for management policies, land - use recommendations, budget requirements, and the ultimate justification for DNR's ownership of the land. In keeping with the growing interest in protecting and understanding our environment, several of the recent master plans, such as those for the Fiske-Hall property, Wompatuck State Park, and Lowell - Dracut State Forest, include provisions for environmental education centers.

Forest Fire Control

Massachusetts has 3.5 million acres of forest land which, like all forest territory, is vulnerable to devastating fire damage. During the two forest fire seasons (which extend from late March to mid-June and from early September through early November) division personnel, trained in fire prevention and control, are always busy. They function not only to prevent and control fires on state-owned land but also to assist local communities in critical forest fire situations. Fifty-two lookout towers, mobile forest fire patrolmen equipped with two-way radios, and back-up personnel and fire apparatus combine to form an excellent fire detection and suppression system.

Because of periodic rains and the alertness of local and state firefighters, 1970 was the least destructive forest fire period in 20 years. Though the number of fires, 5,694, was comparable to fire totals in previous years, only 6,820 acres were burned, an average of less than 1.2 acres per fire. The largest fire in the state occurred in Plymouth (May 1970) near Myles Standish State Forest and burned approximately 400 acres. Of suspicious origin, probably incendiary, it started in the afternoon and was brought under control about 8 p. m.

In 1970 the major portion of fire damage was caused by arsonists, children (playing with matches, etc.), and people burning trash and leaves. Also causing serious damage were smokers whose careless disposal of matches resulted in the scarring of 149 acres.

Forest Development

Since its inception in 1904 Forests and Parks has managed the state's reforestation programs and provided professional advice to private forest owners on the best methods of developing quality timber. In recent years, with the assistance of the U. S. Forest Service's cooperative forest management program, the Division has annually serviced about 10 percent of the 25,000 Massachusetts forest landowners. In 1970 approximately 103 million board feet were cut. Although the logging industry has occasionally received poor publicity because of a few loggers who cut unmarked timber or slash and chop down all timber on a lot, such practices are becoming the exception rather than the rule.

This year Governor Francis W. Sargent signed into law a new type of forest taxation statute requiring a woodland owner, in order to be eligible for lower taxes on his forest property, to commit himself to improving the quantity and quality of his wood products on a long-term basis. The forest owner must submit an approved forest management plan to the State Forester, who then issues a forest management certificate to be taken to the local assessors for classification. At the end of the year approximately 50 requests for certification and classification were being processed, encompassing about 1000 acres.

Pests and Pesticides

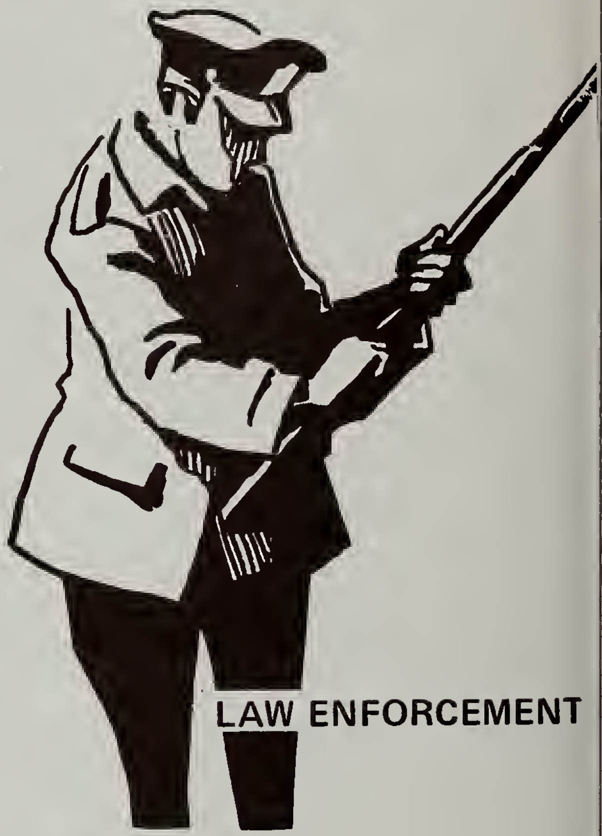
Forests and Parks also has the responsibility for protecting vegetation against insect pests and diseases. For several years the insects causing the caterpillar, the Nantucket pine tip moth, the oak leaf skeletonizer, and the notorious gypsy moth which was accidentally introduced into the state in 1869.

In 1970 alone the saddled prominent stripped nearly 100,000 acres of northern hardwood stands (birch, beech, hard maple) in Berkshire County. The Nantucket pine tip moth browned many acres of pitch pine in Barnstable County, resulting in considerable destruction. The oak leaf skeltonizer defoliated large oak populations in Middlesex and Essex counties, and the gypsy moth denuded some 6,000 acres of oak stands in Barnstable County. Since defoliation and tree loss are problems affecting local as well as state forest lands, the Division offers technical assistance to cities and towns for the control of insect pests and diseases.

The most insidious tree disease in Massachusetts is the Dutch Elm disease which is caused by a fungus and spread largely by the breeding of several species of bark beetles. This disease can be checked only by the prompt extraction of afflicted trees. For this surgical operation the Division has four skilled tree removal crews available to towns on request.

Attempts to control or eradicate insect pests inevitably raise the controversial question of pesticides. They have been, and probably will continue to be for some time, effective agents in the restraint of noxious insects. But we have learned that "hard" or persistent pesticides can do more harm to the environment than the insects they destroy. In 1969 the Massachusetts Pesticide Board (under the Department of Public Health) imposed severe restrictions on the outdoor use of hard pesticides -- DDT, DDD, dieldrin, endrin, aldrin, toxaphene, heptachlor -- with the result that many people found themselves with unusable supplies of these chemicals on hand.

In an effort to prevent people from compounding the pesticide problem by burying these toxic materials, carting them off to the local dump, or flushing them down the drain, Forests and Parks volunteered to act as a collecting agency. At Wompatuck State Park in Hingham two ammunition bunkers, equipped with steel doors and tamperproof locks, now serve as pesticide storage areas. Responsibility for final disposal and destruction of the pesticides lies with the Pesticide Board. At the moment it is thought that the best method of accomplishing the pesticide demolition would be by high heat incineration.



LAW ENFORCEMENT

The responsibility of the Division of Law Enforcement is to protect all the natural resources of Massachsetts, to safeguard land, buildings, and equipment under the jurisdiction of the Department of Natural Resources and to insure the safety of those using Department facilities.

Specifically, the Division, operating with 70 field officers, and utilizing helicopters and patrol boats, has the authority to enforce regulations for hunting, fishing, and trapping and laws pertaining to forest fires, forestry, dogs, motorboats, snowmobiles and marine fisheries. It also has the responsibility to investigate alleged violations of water pollution and inland and coastal wetland laws, to conduct searches for persons lost in the woods, to give courses for minors in the safe handling of firearms, and to respond to Civil Defense and State Police calls for emergency assistance.

In 1970 the two major inland law violations involved fishing without a license and carrying a loaded shotgun in a motor vehicle. Marine law infractions were chiefly illegal possession of lobsters, tampering with lobster gear, and dragging inside the three-mile limit. In checking on dragging operations and possible violations of other marine fishing laws, the patrol boats Mary Caroline and Lula May together logged 16,131 nautical miles. Court prosecutions handled by division personnel totalled 706 and resulted in 598 convictions.

As in the past, the Division has continued to be concerned with better law enforcement and better public safety habits through education. Although reported hunting accidents in 1970 were down 15 percent from the previous year, there were three fatalities, two involving children. Because records show that the major causes of hunting accidents are carelessness, ignorance, and horseplay, the

Division since 1955 has been conducting classes for minors in the proper handling of guns. In 1970 certificates of competency were awarded to 2,829 young people (between the ages of 15 and 18) who had satisfactorily completed the course. This certificate enables a youngster to obtain a hunting license and go out in the field unaccompanied by an adult.

MARINE FISHERIES

The Division of Marine Fisheries is responsible for the protection and development of all living marine resources in Massachusetts's coastal waters. It oversees commercial fishing enterprises, supervises recreational saltwater fishing , and engages in a variety of research projects involving the abundance, distribution, and productivity of marine organisms. The Division also administers all laws affecting marine fisheries, issues thousands of commercial fishing licenses of various types, and initiates control procedures against polluters of coastal waters and persons engaged in unauthorized dredging or filling operations on coastal wetlands.

Commercial Fisheries

Commercial fishing, the state's oldest industry, is in economic trouble because of deteriorating fleets, severe declines in some segments of the fish population, an aging labor force, and competition from fish imports.

While the outlook for Massachusetts's commercial fisheries is not particularly rosy, certain efforts to alleviate the crisis in the industry have proved rewarding. In cooperation with the National Marine Fisheries Service the Division developed

a program to alleviate the impact of the "haddock disaster" on Massachusetts's commercial fishing industry. The program attempted to diversify the fishing effort, demonstrate the economic potential of pollock as a substitute for haddock, and accumulate information on pollock abundance and distribution. Twenty-one vessels, utilizing federal fishery disaster funds, committed their fishing efforts to catching pollock. It appears that fishing pressure on haddock stock was significantly reduced, while pollock landings by participating vessels increased substantially. Extensive efforts to familiarize the public with pollocks' fine taste, so as to create new markets for pollock, were conducted by the Consumer Education and Market Development Program and were highly successful.

Marine Fisheries operates a shellfish purification plant at Newburyport where clams from moderately contaminated areas (9732 bushels in calendar 1969) are treated with ultraviolet light to render them fit for human consumption. The operating deficit is apportioned among cities and towns using the plant's facilities.

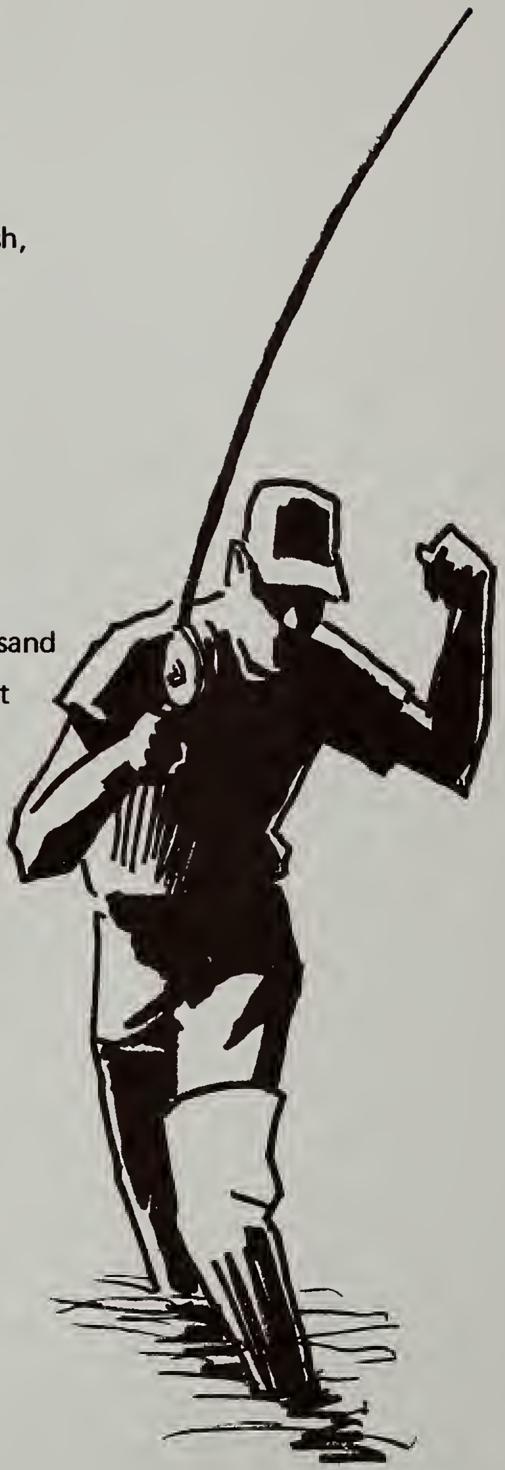
The Division's statistical program involves the compilation, evaluation and dissemination of data on coastal lobster, weir-trap, alewife, and shellfish fisheries. Cooperating dealers participate in a joint federal-state program designed to collect catch statistics for all marine resources taken commercially from Massachusetts's waters.

Sport Fisheries

With its more than 1900 miles of shoreline Massachusetts offers some of the finest saltwater fishing in the country. Long famous for striped bass, bluefish, pollock, cod and mackerel, the waters of the Commonwealth also contain swordfish, marlin and tuna in season. Each year more than 400,000 saltwater sport fishermen take millions of pounds of fish from the state's coastal waters.

Because of the economic importance of the sport fishery to Massachusetts and the increasing demands made on the marine environment, the Division is committed to considering and representing sport fishermen in its management programs. One result of this concern is the Division's experimental project to introduce coho salmon into the North River. In December 1969 one hundred thousand coho salmon eggs were purchased from the state of Washington and later hatched at the Berkshire Fish Hatchery in cooperation with the Berkshire chapter of the Issac Walton League. When the salmon reach the smolt stage, sometime in the spring of 1971, they will be released in the North River, with the expectation that they will return as adults in the fall of 1972. The program, scheduled to run on a trial basis for three years, will involve the planting of 100,000 smolt each year. If the project is successful the implantation of coho salmon could result in increased fishing opportunities on portions of the river now underutilized, extend the fishing season into early winter, and offer to anglers the pleasure and excitement of testing their skills against a fine game fish.

Also as part of the management scheme designed to assist sport fishermen, the Division is working to assure a viable anadromous fish population. Over 46,000



were stocked in fifteen ponds to establish new runs or to bring existing ones to maximum productivity, and approximately 1,530,300 shad eggs (stripped from Connecticut River shad) were transplanted to the Nemasket River, Middleborough.

Research

To a considerable extent the Division of Marine Fisheries, with thirty marine biologists on its staff, is a research agency. The 50-foot research vessel F. C. Wilbour, rigged with hydraulic winches and a towing boom, capable of intensive sampling of finfish, shellfish and crustaceans in both estuarine and offshore waters, gives the Division the capability of conducting physical and biological surveys of the state's coastal waters. Division biologists investigate and clarify spawning activities, distribution, and migration trends of various species of finfish, such as the winter flounder, evaluate the long-term effects of oil spills on the growth and survival of lobsters and finfish, and determine the consequences of power plant discharges (thermal pollution) on marine biota.

Estuaring research is undertaken by two division teams operating on the north and south shores. The purpose of these inventories is to define the extent, variety, and value of marine resources within major coastal bays and estuaries, to estimate the impact of man's activities -- such as construction, filling and dredging -- on particular segments of the marine environment and to recommend wise management plans that can anticipate future human needs. Studies conducted in recent months include Wellfleet Harbor, the Taunton River estuary, Dorchester Bay, and the Waquoit Bay - Eel Pond estuary in Falmouth. In progress are field investigations of Bass River and Plymouth - Kingston - Duxbury harbor.

Marine Fisheries operates a lobster hatchery and research station at Oak Bluffs, a marine laboratory under construction at Cat Cove, Salem, and a field station at Sandwich. Although the Oak Bluffs installation, which began operation in 1950, functions primarily to augment the natural supply of lobsters by rearing larval lobsters from naturally hatched eggs and later releasing them in coastal waters (374,000 lobsters were raised and liberated in 1970), the station is also involved in selective breeding of lobsters and artificial methods of stimulating lobster growth and egg production. The Cat Cove facility, which includes an eight-acre impoundment with tidal gate control, a shellfish culture pier and a research laboratory, will permit extensive and varied shellfish and finfish studies.

MINERAL RESOURCES

Established in 1968, Mineral Resources, the Department's newest division, is authorized to regulate leasing and licensing for the exploration and extraction of mineral resources beneath Massachusetts's coastal waters (''coastal waters'' is defined as the area from the shore seaward to a distance of three miles). Prior to any extraction of mineral deposits, chiefly sand and gravel, the Division will conduct surveys to assess the quality and quantity of the deposits and to determine the feasibility of removals without upsetting the ecological balance within the marine environment or impairing such recreational activities as fishing and swimming.

Since accurate information on the exact locations, quantities, and commercial value of mineral deposits is fundamental to the functioning of the Division, it has devoted a majority of its time in recent months to contract negotiations with six consulting firms competing to conduct coastal water surveys. In order to acquire as much data as possible on the state's offshore waters, the Division has established working relations with the U. S. Geological Survey at Woods Hole, U. S. Army Corps of Engineers, New England Marine Resources Information Program (University of Rhode Island, Narragansett Bay Campus), U. S. Oceanographic Center in Washington, New England Fish and Conservation Committee, New England River Basins Commission, and the Woods Hole Oceanographic Institute.

Although considerable pressure has been put on the Division to allow mining operations to begin, it was felt that the best policy would be to delay granting any permits until more information is available about the effects of such extractions on the marine ecology. Based on this conviction DNR proposed a bill to the legislature in June 1970 which would require a moratorium on all mineral extractions "until such time as the Department has obtained reliable information as to the quantities, quality and location of the resource available within the Commonwealth, and as to the extent of and risk of harm to marine and other natural resources . . . ." (House 5841) A supplemental budget proposal requested funds for a two-part survey -- mineral and environmental. No action has yet been taken on the bill submitted; consequently, in the meantime, applications for mineral extraction will be handled individually and decisions about future mining sites will have to be determined by very general surveys conducted by the U. S. Army Corps of Engineers and the U. S. Geological Survey, Office of Marine Geology and Hydrology.

While profitable commercial mining is the primary reason for this division's existence, every precaution will be taken to assure that the Massachusetts marine environment will not be adversely affected. Biologists from the Division of Marine Fisheries have provided valuable ecological information and the Division of Mineral Resources is currently conducting a detailed study of wave action and beach erosion which will probably be one of the problems created by mineral extraction.

WATER POLLUTION CONTROL

Water Resources Commission

The Water Resources Commission is an eleven-member board composed of the Commissioners of Natural Resources, Agriculture, Commerce and Development, Public Health, Public Works, MDC, the Director of Fisheries and Game, and four public members appointed by the Governor. Functioning primarily as a water management body the Commission coordinates the activities of federal, state, and local agencies involved with the conservation, development, utilization and disposal of water. The Commission also oversees and directs the work of the Divisions of Water Pollution Control and Water Resources.

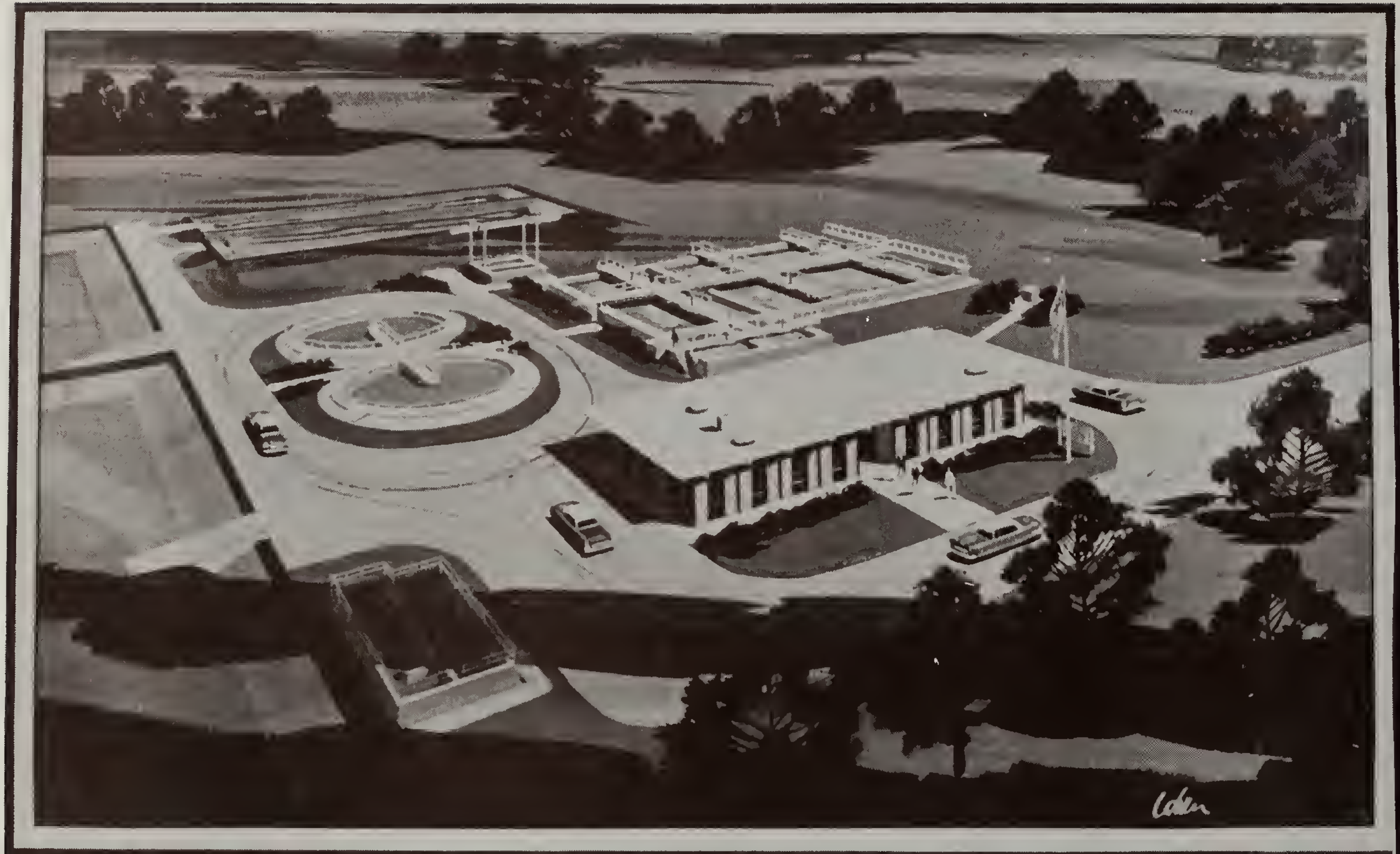
Historical Background

The federal government became deeply committed to the abatement of water pollution in 1956 when Congress passed the Water Pollution Control Act. Act provided for financial aid by the federal government to municipalities constructing pollution abatement facilities. In order to establish a strong water pollution control program in the Commonwealth in coordination with the provisions of the federal Act, the General Court passed the Massachusetts Clean Waters Act in 1966. This Act provided for the establishment of a Division of Water Pollution Control under the Water Resources Commission. The Division was given comprehensive duties and responsibilities including the establishment of water quality standards, the classification of all waters in the Commonwealth, and the establishment of a schedule for the implementation of the standards. To effect compliance with this schedule the Division was authorized to issue orders to violators or to institute criminal proceedings. The Act further made it unlawful for any person to discharge into the waters of the Commonwealth any substance which would adversely affect water quality standards.

In 1967 the Division of Water Pollution Control established water quality standards for all interstate, intrastate, and coastal waters in the Commonwealth. Included in the standards were present and proposed use classifications for each waterbody, critical limits of the amounts of various pollutants allowable in the waters for each use classification, and a plan for the implementation and enforcement of the standards.

Construction Grants

Legislation enacted concurrently with the Massachusetts Clean Waters Act provided a $150 million bond issue to provide aid to municipalities for constructing pollution abatement facilities. This amount was increased by $250



SCITUATE WATER POLLUTION CONTROL PLANT METCALF & EDDY, INC. ENGINEERS

million by legislative action in 1970. In order to be eligible for aid a project must be approved by the Division. The Construction Grants Section reviews engineering reports, final plans and specifications for municipal treatment facilities, and applications for grants for the following purposes: comprehensive planning of wastewater treatment facilities, preparation of final plans and specifications for wastewater treatment facilities, construction of wastewater treatment facilities, and prefinancing of federal grants for wastewater treatment facilities. Grants for these programs totalled $13,579,610 in 1970.

Operation and Maintenance

In order to effectively abate water pollution, a treatment plant must be operated properly. The Operations and Maintenance Section attempts to insure proper operation through plant inspections, review of monthly operating records, plant personnel training programs, and, in extreme cases, direct orders from the Division and refusal to approve applications for new sewer permits. The mandatory certification of plant operators should upgrade the quality of plant operation throughout the Commonwealth.

Research and Training

The Massachusetts Clean Waters Act authorized $10 million over a 10-year period for a research and demonstration program. This program is designed to provide increased knowledge in the areas of analysis and abatement of water pollution. Research grants are made to consulting engineers, universities, and research institutions to conduct particular projects. Training activities of this Section include treatment plant operator training, in-service training of Division personnel, and a scholarship intern program for engineering students.

Water Quality Management

In order to properly solve water pollution problems it is necessary to consider entire river basins rather than particular waste discharges. The waters of the Commonwealth are divided into 17 major river and coastal basins. The Water Quality Management Section conducts surveys of these basins and analyzes and publishes the results. Where sufficient data is available a river is analyzed by a computer model. Such models simulate the level of dissolved oxygen and other parameters along the entire length of a stream, enabling Section personnel to determine the degree of treatment required at each discharge to maintain the desired level. This Section also develops basin plans which present alternative solutions to pollution problems in a particular basin.

Regional Offices

The Division maintains four regional offices which have responsibility for particular river basins and coastal waters. Besides assisting the seven sections of the central office in their functions, the regional offices investigate complaints of water pollution, visit construction sites to supervise progress on pollution abatement projects, inspect and sample wastewater treatment plants to provide precise data on the efficiency of their operation, conduct local operator training courses, and provide liason between local groups and the Division. Regional personnel acquire an intimate knowledge of local problems which is invaluable to the Division's planning.

Enforcement

The schedule for implementation of the water quality standards established dates for reaching the several steps of a pollution abatement program for each of some 550 known municipal and industrial polluters. The Enforcement Section is responsible for effecting compliance with this schedule through cooperative action where possible and legal measures when necessary. During 1970 a total of 183 new orders were issued, 48 cases were referred to the Attorney General and 12 court orders were obtained.

Industrial Wastes

The large number and diversity of industries discharging wastes into the waters of the Commonwealth requires critical review of reports and plans for industrial treatment facilities. In reviewing proposed designs, engineers of the Industrial Wastes Section meet with the industries and their consulting engineers to insure installation of the most efficient pollution abatement facilities. Additional activities of this Section include inspection of newly-operating industrial treatment plants, processing of applications for certification of treatment facilities, assisting in locating new sources of pollution and establishing implementation schedules, and directing pilot plant studies on the treatment of industrial wastes. During 1970 sixty-nine industries completed construction of treatment or pretreatment facilities; 27 other industries connected directly to municipal sewerage systems.

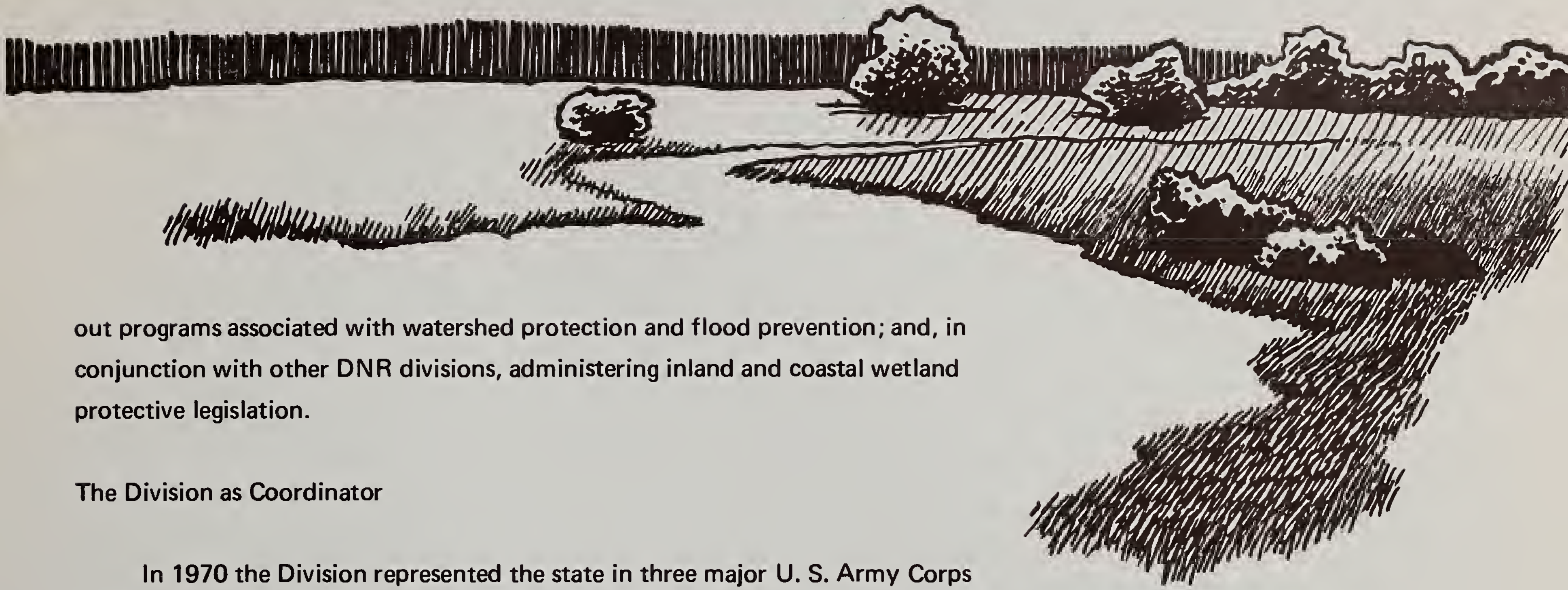
Oil Pollution

Increased concern with the detrimental effects of oil pollution led to the passage of the Massachusetts Oil Pollution Act of 1968, which was further strengthened in 1970. This Act provided for the immediate cleanup of all oil spills and the licensing by the Division of all marine oil terminals and waste oil collectors. The Oil Pollution Section initiates the cleanup of oil spills when required to protect water quality, finances the operation, then recovers funds from the source of the spill. The section also maintains a continuing program of research to develop and evaluate new methods for oil pollution abatement. In 1970 the Division cleaned up 15 of the reported oil spills at a cost of $88,605.

WATER RESOURCES

Established as the operational arm of the Water Resources Commission, the Division of Water Resources is a water resource management, planning and research agency involved with the needs, supplies, effects and uses of water in Massachusetts. In particular, it is concerned with water conservation, flood prevention, and the formulation of a basic water policy consistent with the varied requirements of agriculture, industry, recreation, wildlife, and domestic consumption.

The Division's functions include participation in federal, state and regional comprehensive water resource studies; cooperating with various agencies in carrying



out programs associated with watershed protection and flood prevention; and, in conjunction with other DNR divisions, administering inland and coastal wetland protective legislation.

The Division as Coordinator

In 1970 the Division represented the state in three major U. S. Army Corps of Engineers studies: the Connecticut River Basin Comprehensive Investigation, the North Atlantic Regional Water Resources Study, and the Northeast Water Supply Study. In addition, the Division furnished precipitation data to the U. S. Weather Bureau; cooperated in a program with the U. S. Geological Survey to obtain stream gauge statistics and groundwater favorability studies; continued its liaison with the U. S. Soil Conservation Service in the administration of the federal "Small Watershed" program (completed one site in Sandisfield); assisted the New England River Basins Commission ingathering preliminary data for a study which will identify water and related land resource needs in all the coastal drainage systems of Massachusetts and Rhode Island (with the exception of the Merrimack River); and compiled data, in cooperation with the U. S. Geological Survey and the U. S. Army Corps of Engineers on annual precipitation and flooding conditions occurring in Massachusetts. In addition, the Division was represented on the Thames, the Connecticut, and the Merrimack River Valley Flood Control commissions which were established by interstate compacts.

Wetland Protection

The pressure on wetlands for residential, commercial, and industrial development is reflected in the fact that approximately 100 applications have been filed for the excavation and filling of wetlands in the Neponset River watershed alone. This myopic emphasis on development overlooks the vital importance of swamps and marshes as natural catch basins that regulate water by storing it during floods and releasing it in time of drought. If filling and development destroys the natural storage capacity of a floodplain, the damage resulting from even a minor flood can be excessive because the downstream discharge will be substantially increased by water that can no longer be stored in the wetland. In the Neponset River flood of March 1968 extensive downstream destruction was avoided because of the exceptional storage capability (equivalent to 2.77 billions of gallons) of the Neponset floodplains.

Hydrologic engineers of the Division reviewed 418 Hatch Act applications in 1970 to determine their effect on water resources and flood control. Division personnel also assisted in the implementation of legislation affecting coastal wetlands.

PUBLIC ACCESS BOARD

Particularly responsive to public needs is the five - member Public Access Board which functions within the Department of Natural Resources. Board members include the Commissioner of Natural Resources, the MDC Commissioner, Commissioner of Public Works, Director of Fisheries and Game, and the Director of the Division

of Motorboats of the Registry of Motor Vehicles. Empowered to acquire land by purchase, gift or eminent domain with the Governor's approval, the Board serves primarily to consider, and designate for construction, points of recreational access to the waters of Massachusetts. Freshwater great ponds and streams and coastal waters are natural attractions for the fisherman, hunter, and recreationist, but access to these waters is often obstructed by local ordinances limiting the use of pond, stream, or ocean water to shoreline owners, by lack of boat-launching facilities or by the indifference of private marina owners.

In Massachusetts ponds are often surrounded by developed private land whose owners are legally able to bar the public from the water. The law of the seashore grants even fewer public rights. The area down to the high-water mark, popularly known as the "beach," is almost always private property.

Aware of the public need for access facilities, the Board began in 1964 a porgram of land acquisition and public landing construction, with the result that there are now 31 landings on freshwater ponds, 9 on freshwater streams, and 19 along the tidal coastline. In 1970 launching ramps and parking lots were completed at John's Pond, Mashpee; Sesuit Harbor, Dennis; Lake Nippenicket, Bridgewater; Shaw Pond, Otis; Lake Attitash, Merrimac; Chebacco Lake, Hamilton; Richmond Pond, Richmond; Long Pond, Freetown; and Manchaug Pond, Sutton. Under construction are facilities at Peter's Pond, Sandwich, and Oak Island on Flint Pond, Shrewsbury.

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